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LYMPHOGRAPHIC INVESTIGATION OF PANNICULITIS OF THE LEGS

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Abstract. Since 1967 we have performed lymphography of the lower limbs in 90 patients with panniculitis of the legs. Of 8 patients with erythema nodosum, 2 had pathological changes in the lymphadenogram. In one of them the nodal eruption was provoked by sarcoidosis and in the other probably by tuberculosis. Of 44 patients classified as having erythema induratum (EI), 16 had pathological retroperitoneal lymph nodes. The corresponding number in the group of non-definite panniculitis (NDP) was 14 out of 38. Filling defects, regarded as indicative of sarcoidosis, tuberculosis, or malignant lymphomas, were found in 5 patients with EI and in 2 with NDP. Follow-up lymphadenograms were taken, especially in those cases showing defects or irregular structure in the initial lymphadenogram. In 12 of the 15 patients followed up lymphographically, the lymph nodes diminished in size during antituberculous treatment. The improvement was visible within 3 months of treatment. The response of the retroperitoneal lymph nodes to antituberculous treatment tallied with the clinical result in most cases. It is concluded that lymphography serves as a complement to the conventional examinations used in the evaluation of panniculitis of the legs. Moreover, repeated lymphograms from patients with pathological retroperitoneal lymph nodes offer us a new opportunity to observe the course of the disease and the effect of the treatment given.

In 1967 we introduced lymphography of the lower limbs as an additional measure for tracing the tuberculous process in cases of erythema induratum Bazin. In a pilot study comprising 16 patients with this disease the examination revealed lymphographic changes compatible with tuberculosis of the retroperitoneal lymph nodes in 4 cases (8). Since then, we have performed lymphography as a routine procedure in patients with panniculitis of the legs, except in cases with erythema nodosum, in which it has been carried out in selected cases only. This report deals with the lymphographic results obtained in these patients.

MATERIAL

The series comprised 90 patients with various diseases presenting as panniculitis on the legs. Eight of them had erythema nodosum (EN), 44 were interpreted as erythema induratum (EI), and 38 had other forms of panniculitis which could be classified neither as EN nor as EI, so-called non-definite panniculitis (NDP).

The diagnosis of EN was based on the clinical picture and histological findings (9, 13). In 6 cases it was typical and in 2 cases of migrans type. The eruption was associated with sarcoidosis in 3 patients, and with acute respiratory infection in 1 patient. In 2 patients the eruption was possibly provoked by contraceptives and in one, probably by tuberculosis. In 1 patient the agent triggering the eruption remained obscure.

All patients with EI had cold nodules on the calves, in most cases also elsewhere on the legs, and in a few cases also on the thighs, buttocks or penis. Some of the nodules ulcerated in all except 11 cases. In these, however, skin biopsy revealed caseation necrosis in subcutaneous tissue. Every case was examined histologically. Only those with at least two of the three histological criteria of EI (vasculitis, granulomatous infiltration in subcutaneous tissue and caseation necrosis) were included in the series of EI. For further details, see Table 1.

Lymphographic method and interpretation of lymphograms

Lymphography was performed by Kinmonth's method (10, 11). The lymph vessels were visualized with a 2.5% aqueous solution of Patent Blue Violet (Lab. André Guerbet, Aulnay-sous-Bois, France). The lymph vessel was exposed and the contrast medium injected by the simplified technique introduced by Wiljasalo (18). The contrast medium used was Lipiodol Ultra Fluid® (Lab. André Guerbet, Aulnay-sous-Bois, France), marketed in the USA as Ethiodol®. It was injected into the feet, the dose being 1 ml per 10 kg body weight. Immediately after the injection an antero-posterior film was taken of the pelvic and abdominal regions and, if necessary, of the lower limbs. Lymphadenographic films were taken 24 hours later in the A.P. and two 45 degree oblique projections. The contrast medium persists in the lymph nodes for several months, and therefore follow-up lymphadenograms can

Table I. *Composition of the series of 90 patients with panniculitis of the legs*

Diagnosis	Sex M	Sex F	Mean age (y.)	TB in History	TB in Family	Mean duration of disease (y.)	Location Calves	Location Thighs, buttocks	Location Arms	Location Other	Ulceration
EN	—	8	34	1	Not known	4/12	2	2	1	—	—
EI	6	38	49	10[a]	19	8	44	7	5	1	33
NDP	2	36	48	7	8	4	14	7	11	1	8
Total	8	82		18			60	16	17	2	41

[a] One patient had papulonecrotic tuberculids simultaneously with EI lesions.

be taken without new injection of contrast material up to 8–12 months.

The lymphatic system was considered normal if all lymph nodes had a homogeneous and dense structure and appeared narrow in at least one of the three projections used. Rounded lymph nodes with a structure looser than normal were considered pathological. The pathological lymph nodes were divided into two groups according to storage pattern, regular and irregular images. In the former group the lymphogram displayed a uniform distribution of contrast medium droplets of even size and a somewhat loose structure throughout the nodes. In the later group, droplets of contrast medium formed conglomerates in the markedly enlarged lymph nodes and the distribution of the looser structure was uneven. Areas of various size devoid of contrast medium, and with an appearance clearly different from the basic structure of the lymph node, were regarded as filling defects.

Complications to lymphography. The dye or the contrast medium did not cause reactions in any of the present patients, neither could pulmonary embolism be detected clinically in any of them. Slight suppuration of the wound occurred in 2 patients. Nevertheless the wound healed within 2 weeks.

RESULTS

Of the 2 EN patients with pathological lymphograms (Table II), one had sarcoidosis, verified by a positive Kveim test, and the other, who was found to have markedly enlarged retroperitoneal lymph nodes with an irregular structure, had suffered from exudative pleuritis 51 years earlier and had tuberculosis in her family. One of the patients with normal retroperitoneal lymph nodes had lymph cysts in both legs and her pelvic lymph vessels were enlarged.

Table II. *Lymphographic findings in 90 patients with panniculitis of the legs*

Diagnosis	No. of cases	Normal lymph nodes	Pathological lymph nodes: Regular storage pattern	Pathological lymph nodes: Irregular storage pattern	Pathological lymph nodes: Defects	Pathological lymph nodes: Total
EN	8	6	1	1	—	2
EI	44	28	9	2	5	16
NDP	38	24	12	—	2	14
Total	90	58	22	3	7	32

Of the 44 patients classified as having EI, 16 had pathological retroperitoneal lymph nodes and 2 others had lymph cysts in their right legs. An irregular storage pattern was demonstrated in 2 patients, one of whom had mention of tuberculosis in her personal history. Defects in the retroperitoneal lymph nodes were seen in 5 patients, one of whom, simultaneous with EI lesions, had papulonecrotic tuberculids and on her face discoid LE lesions without clinical or laboratory evidence of systemic LE. Another patient with lymph node defects had a personal history of tuberculosis.

Of the 38 patients with NDP, 14 had pathological retroperitoneal lymph nodes and 1 other patient had lymph cysts. The pathological changes appeared as moderate enlargement of the nodes, the structure of which had remained regular. Defects were encountered in 2 patients. One of the last-mentioned patients had fever with each bout of nodules on her calves. Biopsy revealed a pleomorphic inflammatory infiltrate in the dermis and upper subcutis, with numerous giant cells of both Langhans and foreign-body type, and endothelial proliferation in small arteries and capillaries, but neither granuloma formation nor caseation necrosis. The large defects can be seen in Fig. 1. The other patient had nodules clinically suggestive of Weber-Christian panniculitis, but the histology was that of an EI lesion. The no-

Biopsy			Mantoux positive to TU of PPD				
Vasculitis	Granulomas	Caseation necrosis	0.01	0.1	1	10	100
8	—	—	—	2	3	3	6
38	44	38	13	37	44	44	44
35	22	15	5	31	36	38	38
81	66	53	18	70	83	85	88

dules, which appeared on her knees, calves, buttocks and forearms, were accompanied by pain in the joints. There was no clinical or laboratory evidence of SLE. Her brother had lung tuberculosis, but she herself had no history of tuberculous infection.

Of the 32 patients with pathological lymph nodes, 3 had changes in the iliac nodes only and 10 in the para-aortic nodes only, whereas both lymph node groups were involved in the remaining 19 cases. No significant differences could be seen between the three diagnostic groups as to the distribution of the pathological lymph nodes.

After examinations, antituberculous treatment was instituted in all cases of EI and in those cases of EN and NDP in which the personal history or clinical data or the result of the lymphography suggested a tuberculous origin of the lesions. The tuberculous treatment consisted of streptomycin (1–3 months), isoniazid, and para-aminosalicylic acid (PAS) in all but 1 patient, who was treated with isoniazid alone. In some of the patients PAS was later replaced by pyrazine amide because of intolerance reactions. None of the patients received steroids. During antituberculous treatment new lymphadenograms were carried out every 3 months as a rule, especially in those cases showing defects or irregular image in the initial lymphograms. The lymphographic findings in the 15 patients from whom new lymphadenograms were taken, are shown in Table III. The lymph nodes had diminished in size in all but 3 cases. These changes were already visible in the lymphograms taken after 3 months of treatment. In 11 (1 case of EN, 7 of EI, and 3 of NDP) of these 15 patients the nodules on the legs resolved within 6 months of treatment, and mostly within 3 months, but reappeared in 1 case of EI and in 1 case of NDP when the treatment was discontinued after periods of 18 and 5 months, respectively.

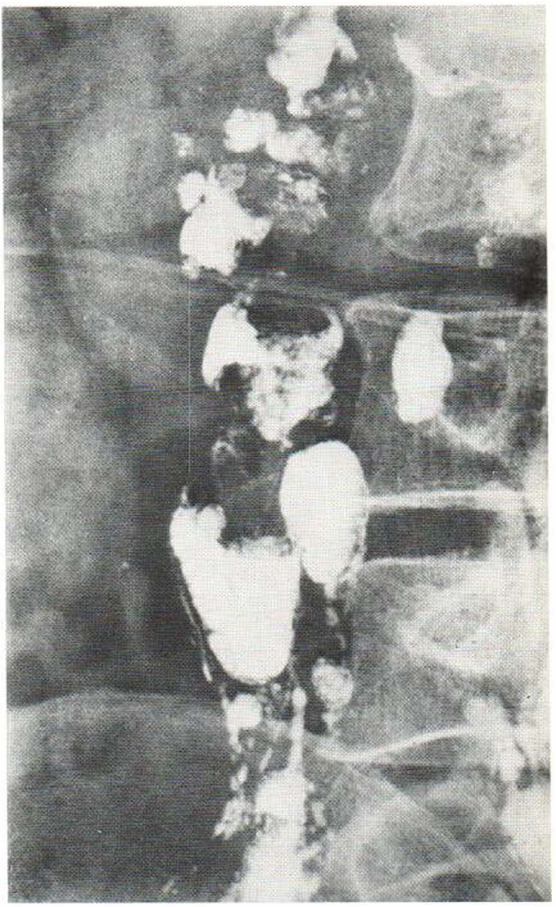

Fig. 1. Markedly enlarged retroperitoneal lymph nodes with large filling defects. The patient had X-ray evidence of previous lung tuberculosis. The connection of the lymphographic findings with the panniculitis of the legs remained unproved. The disorder was classified as NDP.

DISCUSSION

The clinical and histological differentiation of EN from other types of panniculitis of the legs seldom presents difficulties. The differentiation of other types of panniculitis from each other is always difficult and often impossible. Opinions differ concerning the aetiology of EI and the justification for such diagnosis. The good response often obtained with antituberculous treatment (5, 6, 7, 20) seems to speak in favour of a tuberculous origin in many cases although the frequency may differ considerably in different

Table III. *Lymphographic findings after antituberculous treatment in 15 patients with pathological retroperitoneal lymph nodes in the initial lymphogram*

Case	Diagnosis	Lymphography before treatment			Duration of treatment until last lymphogram (months)	Last lymphogram	
		Enlarged nodes	Irregular structure	Defects		Nodes diminished in size	Nodes unchanged
L. N.	EN	+	+	−	12	+	
M. P.	EI	+	−	−	18	+	
L. K.	EI	+	+	−	8		+
A. H.	EI	+	−	+	6	+	
A. M.	EI	+	+	−	2	+	
P. L.	EI	+	−	+	10	+	
A. T.	EI	+	−	+	5	+	
T. S.	EI	−	−	−	5		+
H. S.	EI	+	−	−	3	+	
A. L.	EI	+	−	−	11	+	
S. L.	EI	+	−	+	12	+	
T. P.	NDP	+	−	+	18	+	
S. R.	NDP	+	−	−	3		+
K. T.	NDP	+	−	−	18	+	
K. M.	NDP	+	−	−	6	+	

countries, depending on the prevalence of tuberculosis. However, a combined antituberculous treatment which includes streptomycin will act on other infections, too. In fact, the antibacterial spectrum of streptomycin is rather broad.

The lymphadenogram is a two-dimensional representation of the three-dimensional network of the lymph node sinuses (12). Any pathological process that causes a change in the number and size of the follicles and an alteration in the width and general arrangement of the sinuses will therefore be reflected in the lymphadenogram (16). The most frequent application of the lymphographic method has been in cases of primary and secondary malignant neoplastic invasion of lymph nodes. Several authors have also reported pathological changes in the retroperitoneal lymph nodes in many non-neoplastic diseases. In sarcoidosis, pathological alterations have been observed, on an average of 65% of cases (1, 2, 3, 14, 15). Moderate or marked enlargement of the lymph nodes, a rounded configuration, an architecture uniformly looser than normal, and in some cases multiple filling defects due to small granulomas, have been the most frequent findings. The pathological changes seen in tuberculosis resemble those in sarcoidosis. There is consensus of opinion, however, that the changes typical of tuberculosis are well-defined defects of various size, seen either locally or throughout the retroperitoneal lymph nodes and easily mistaken for carcinomatous metastases (2, 17). In addition, Bétoulières et al. (4) observed that lymphographic features of diffuse adenitis also may occur in tuberculosis. However, according to Rauste (14), the rate of pathological findings is higher in SLE (90%) than in sarcoidosis or tuberculosis (about 40%).

In the present study, the incidence rate of pathological lymphograms was the same in EI as in NDP (36%). However, the lymphographic changes found in the three groups of panniculitis differed from each other in some respects. Marked enlargement of the lymph nodes with irregular storage patterns was encountered in 1 case of EN of probable tuberculous origin and in 2 cases of EI, whereas none of the patients with NDP had such lymphographic findings. The rate of irregular images in the EI group tallies with that found in cases with definite tuberculosis (14). Defects were never seen in the lymphadenograms of patients with EN. In the EI group, 5 patients (11% of the whole series and 31% of those with pathological lymph nodes) and in the NDP group 2 patients (5 and 14%, respectively) displayed filling defects. In the series of Rauste (14), defective images were only encountered in sarcoidosis, tuberculosis, EI and malignant lymphomas.

In 15 patients new lymphadenograms were obtained after the start of antituberculous treatment. As seen in Table III, treatment brought about

significant changes in the size of lymph nodes in all but 3 cases. Of the 7 patients with filling defects, 5 were followed up lymphographically, and a diminution in the size of the lymph nodes was observed in all of them after institution of therapy. In 2 of the patients in the EI group, both exhibiting non-specific adenitis in lymphography, antituberculous treatment did not influence the lymphographic findings. Probably the changes in these cases were of non-tuberculous origin. In one of them the nodules on the legs did not respond to antituberculous treatment, either. In the other, the nodules reappeared immediately when treatment was discontinued after 18 months. None of the patients received steroids, which, according to Wiljasalo (19), may cause a decrease in the size of even normal lymph nodes.

Lymphography serves as a complement to the conventional examinations used in the evaluation of panniculitis of the legs. Moreover, follow-up lymphograms give us information about the effect of the treatment given.

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